Fluoridation and the Dentist

Proponents of fluoridation of public drinking water—the United States Public Health Service among them—claim that addition of one part of fluoride to a million parts of water will prevent tooth decay in 60 to 70 per cent of children up to sixteen years of age who drink the water.

If this claim is justified, elementary logic suggests that the pattern of dental practice in towns supplied with fluoridated water ought to differ substantially from the pattern of dental practice in towns where water is not fluoridated.

Do such differences in fact exist?

In the belief that the answer would be affirmative, three researchers at the University of Illinois College of Dentistry three-and-a-half years ago asked USPHS to finance a study of eight sets of American communities to discover how extensive the differences were. The towns were closely matched to bring out the assumed advantages of fluoridated water over unfluoridated water: Aurora (fluoridated), Freeport, and Kankakee, Illinois; Kewanee (fluoridated) and Centralia, Illinois; Marion (fluoridated) and Sandusky, Ohio; Joliet, Illinois (fluoridated), and Mansfield, Ohio; Elwood (fluoridated) and Connersville, Indiana; Huntington (fluoridated) and Shelbyville, Indiana; Frankfort (fluoridated) and Crawfordsville, Indiana; Pueblo, Colorado (fluoridated), and Beaumont, Texas.

USPHS put $50,000 into a two-year feasibility study and then, in the autumn of 1966, added $167,000 to pay for the actual research project.

No reports of findings have yet been published in medical journals or elsewhere in the scientific literature. But on June 10 last, the office of public information at the Medical Center, University of Illinois (Chicago), mailed to communications media throughout the country a press release worded:

> Fluoridated water, a well-known agent for improving dental health, has apparently had little effect on dental practice, according to initial research findings at the University of Illinois College of Dentistry, Chicago.
>
> Preliminary results indicate there is little difference between dental practice in communities with fluoridated water and communities with a fluoride deficiency, says Dr. Bruce L. Douglas, principal investigator for the three-and-a-half-year research project that has compared dental practice in eight sets of communities.
>
> Dr. Douglas, professor of community dentistry, and Miss Sylvia Coppersmith, field director and a laboratory program administrative assistant . . ., assisted by Dr. Donald A. Wallace, professor of dental radiology . . ., began the project with the hypothesis that water fluoridation alters the nature of dental practice.
>
> They expected to find variations in dental treatment, patient loads, and dentists' income and practices in communities with fluoridated water.
>
> However, they have found an apparently similar number of patients who seek dental treatment in both types of communities. They also have found that most patients apparently visit a dentist when they are in pain or obviously in need of care; few people go for preventive dental care.
>
> After many studies proving fluoride's effectiveness in fighting cavities, this research marks the first large-scale attempt to measure its effect on the private-practicing dentist.
>
> One possible explanation for fluoridation's apparent minimal impact on dental practice is that population growth has outstripped the availability of dentists to attend to the dental needs of the public, even in fluoridated communites.
>
> * * *
>
> As an adjunct to the larger research project, Dr. Douglas and Miss Coppersmith also have discovered that fluoridated water has little effect on the age at which children first visit a dentist's office, also contrary to original expectations.

The press release did not include population statistics to support the view that population growth might explain the departure of the real situation from the one that the researchers had originally supposed. United States Census Bureau figures for the towns concerned in the years 1950 and 1960 are listed below:

	1950	1960
Aurora	50,576	63,715
Freeport	22,467	26,802
Kankakee	25,856	27,666
Kewanee	16,821	16,324
Centralia	13,863	13,904
Marion	33,817	37,079
Sandusky	29,375	31,989
Joliet	51,601	66,780
Mansfield	43,564	47,325
Elwood	11,362	11,793
Connersville	15,550	17,698
Huntington	15,079	16,185
Shelbyville	11,734	14,744
Frankfort	15,028	15,302
Crawfordsville	12,851	14,466
Pueblo	63,685	91,181
Beaumont	94,014	119,175

If shifts in population do not explain the absence of fluoridation's anticipated effect on dental practice, it seems reasonable to ask: What does? USPHS should examine this question as vigorously as it has promoted fluoridation.

—J. L.

"I'll bet you forgot to thank my father for the lovely wedding."

Letters to the Science Editor

Signpost for Handler

AT A TIME when the Duke University environment is providing our nation with one of its top scientific advisers, Dr. Philip Handler ["Will the Science Brain Bank Go Conglomerate," *SR*, July 5], it is ironic that this very environment is being threatened. A portion of Duke Forest, "the only forest in the country with a forestry school of its own," has been leased by Duke University to a large industrial firm. One factor in the choice of this site is the availability of New Hope Creek for waste disposal. At present, this stream flows through the forest for many miles virtually unaffected by man. Alternate sites with the desirable characteristics of New Hope Creek do not exist nearby.

In an age of increasing ecological crisis, the Research Triangle universities (Duke University, the University of North Carolina at Chapel Hill, and North Carolina State University) have been prominent in developing programs to study, understand, and act upon ecological problems. This type of research requires, among other things, the availability of areas unaffected by man. Since, over billions of years, less efficient ecosystems are selected against, our remaining natural systems represent the best means of survival. Man can learn a great deal about organizing his own societies by studying these natural societies. Our very survival may be dependent upon this.

Although this is a local issue, its implications are much broader. If we can no longer protect our ecological research facilities, what hope can there be for the rest of the world?

John Lear reports that Dr. Handler does not yet know where his current experiments will take him. I can only hope that in his new capacity as president of the National Academy of Sciences, Dr. Handler might move in the direction of understanding and eliminating the existing and potential desecration of our environment that all too often has been the result of man's previous science.

CHARLES A. S. HALL,
University of North Carolina,
Chapel Hill, N.C.

Horned Moon

DR. J. J. GILVARRY has me (and I am sure many others) on the horns of a dilemma. In his article, "What Are the Mascons?" [*SR*, June 7], he says the moon is about "one-fifth the present terrestrial radius, one-ninetieth the present terrestrial mass."

All astronomy books say the barycenter of the Earth-moon system, found by apparent solar diameter at lunar semiperiods, is 2,903 statute miles from the center of Earth mass; with this figure the mass of the moon would be about 1/81.3 that of Earth, not one-ninetieth. Also, the diameter (or radius) ratio to the Earth is given as about 27 per cent, or closer to one-fourth than one-fifth.

Dr. Gilvarry should be willing to clarify this discrepancy from traditional data.

HARRY L. GEPHART,
Lt. Col. USAF (Retired),
Assistant Professor,
Mechanical Engineering,
New Mexico State University,
Las Cruces, N.M.

EDITOR'S NOTE: *Dr. Gilvarry says: "Colonel Gephart is completely correct. The ratio of the radii is closer to one-fourth than to one-fifth, the mass ratio is nearly one-eightieth. This is a regrettable slip, which happily does not affect the accuracy of the gravity ratio with which the mascons are primarily related."*

THE ARTICLE "What Are the Mascons?" was interesting. Several questions come to mind, however. Mr. Gilvarry states that he had made calculations showing that instead of adding mass to the moon, meteorites "would hit at such speed that they would pulverize themselves, shoot the pulverizations off into space, and pare mass from the point where they struck the lunar surface." Fine. From a solid or "frozen" surface. But surely Mr. Gilvarry is aware that the action and effects of a projectile must be considered in relation to the consistency of the target medium. If he assumes that the meteoric impacts occurred while the moon was still in a "plastic" state, or molten beneath a thin crust, then perhaps he might take a second look at his "pulverizations." And by what line of reasoning does he assume that the "sedimentary rocks" would possess greater mass or density than the surrounding crust? This would seem to require the assumption that the material which was washed into craters was inherently more dense than that not so transported.

LEON SINES,
Templeton, Calif.

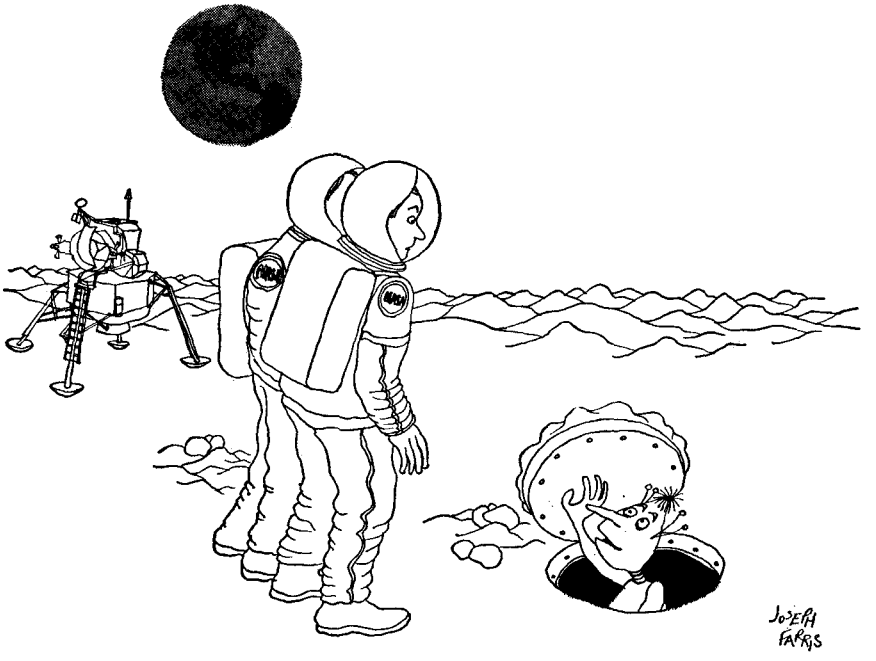
EDITOR'S NOTE: *Meteorites arrive on the moon at speeds well in excess of a mile a second. At that speed, the effect of the kinetic energy alone is about equal to that of an equivalent mass of TNT. As in the case of an explosion from TNT, the effect would not depend on whether the blasted object were plastic or not. A jump from a bridge as high as the Golden Gate or the Brooklyn Bridge results in instantaneous death from the impact, whether the jumper lands in the water (plastic) or on the deck (solid) of a passing steamer. The essential requirement for meteoritic shaving of the lunar surface is that no atmosphere be present on the moon at the time. An atmosphere slows down the ejected particles and returns them to the parent body, as happens on the Earth.*

At no point did Dr. Gilvarry state that sedimentary rocks would possess greater mass or density than the surrounding crust. He attributed the magnetic anomaly of the mascons to their uncompensated isostasy.

AFTER READING the many *SR* articles on mascons, moons, and craters, I remain confused as to the nature of craters. If craters are round, the impacting object or meteor should come in perpendicular to lunar surface. Would you not expect some to come in at least semi-tangentially; at high speed, would these not hit an oblique blow leading to elliptical or oval or egg-shaped craters? Yet, I have never seen such in a moon photo.

PHILIP SELLING, M.D.,
Portland, Ore.

EDITOR'S NOTE: *Most meteors strike at such high speeds that they penetrate the surface and then explode. The explosion leaves a round crater. Oval-shaped craters*



"I'm the man in the moon. Who are you?"